The Orthopaedic Research Center was formed to increase knowledge and advancements in the prevention, treatment and cure of orthopaedic-related diseases and disorders, especially those involving the spine.

The impact of spinal disorders and its associated degenerative diseases is staggering. The annual cost of spinal disorders in the United States ranges from $25 to $100 billion – on a par with the cost of natural disasters. An estimated 50% of workers disabled by low back pain for 6 months and 75% of workers disabled for a year do not return to productive work. Dr. Nabil Ebraheim, chairman of orthopaedic surgery at MCO, describes the problem: “Back pain can be some of the worst pain you’ll ever feel, and it can affect you more than just physically. The challenge of performing what were once simple tasks, become emotionally frustrating as well as a physically painful experience.” Because it is estimated that 85% of all people will experience episodes of back pain at some time in their lives, advances in understanding the causes and preventive measures that can be taken will have a significant impact for the science of spine disorders and most importantly for the individuals experiencing this discomfort and debilitation.

How you can help

The Medical College of Ohio Foundation has set up a fund specifically for the support of orthopaedic research. Your contributions can be earmarked for a specific area of study such as spine research, or as general funds that can be utilized in any of the areas of orthopaedic research and study as deemed necessary.

If you would like to find out more about the Orthopaedic Center Research Fund, and the areas of research that it supports, please call (419) 383-5014, or mail any inquiries to Medical College of Ohio, Department of Orthopaedics, Dowling Hall, 3065 Arlington Avenue, Toledo, Ohio 43614. You can mail your contributions to MCO Foundation, the Orthopaedic Center Research Fund at the same address, or you may contribute online by going to our secure site at https://www.mco.edu/foundation/giving.html. If you would like to find out more about the orthopaedics program at MCO visit our Web site at www.mco.edu/depts/ortho.

Your assistance is important and appreciated. Contributions today can mean a more comfortable and better quality of life tomorrow. Thank you for your support.

The Orthopaedic Research Center Team
Nabil Ebraheim, 419-383-4020, nebraheim@mco.edu
Vijay Goel, 419-530-8035, Vijay.Goel@utoledo.edu

The Orthopaedic Research Center
Medical College of Ohio
Department of Orthopaedics, Dowling Hall
3065 Arlington Avenue
Toledo, Ohio 43614
The importance of working together

The Medical College of Ohio and the University of Toledo’s School of Engineering have formed an interdisciplinary team of investigators including researchers and physicians from diverse fields such as medicine (orthopaedics, anatomy, radiology), engineering (bioengineering, mechanical), and health care professionals trained in physical therapy. This group works together in a collaborative effort to understand the complex nature of the human skeletal system especially the spine and its disorders. Through the leadership of Dr. Nabil Ebraheim, chairman of the department of Orthopaedic Surgery at MCO and Dr. Vijay Goel, chairman of the department of bioengineering at UT and dedicated efforts of the team of professionals with whom they work, we have been able to continue to advance our knowledge and reach new frontiers in various areas of orthopaedic research, including spine.

The importance of research

It is essential to understand the causes of various abnormalities such as spinal disorders and degeneration and the pain associated with those abnormalities. Through research we increase our understanding that can in turn lead us to new and effective procedures and therapies to prevent and minimize the pain and discomfort for the patient. There is a great need to devise ways to reduce the incidence and prevalence of back disorders, especially in the workplace: those induced by prolonged sitting, chronic vibration exposure, heavy lifting, and other activities. To enhance the effectiveness of surgical procedures, studies designed to increase the understanding of the mechanics of spine surgery and to assess the outcome of various procedures and therapies are necessary.

The primary research interests can be categorized as – basic, preventive, and interventional. A brief explanation of each follows:

Basic

Study of spinal disorders that affect the elderly, such as osteoporosis and spondylolisthesis, represent an ongoing area of basic research. Other significant areas of basic research include: projects which utilize new imaging technology in the study of spinal disorders such as whiplash, study of disc degeneration and the potential role of gene therapy and fusion to reverse the degenerative process; and neurophysiological investigations of spinal disorders and response of the nervous system to loads and spinal manipulation.

Ergonomic evaluation of the workplace

The Center staff is dedicated to reducing the risk of back trouble through education and worksite improvements. Current projects evaluate environments where seating, vibration and/or sudden-impact loads play a significant role in the incidence and recurrence of back pain in the workforce. The Center has state-of-the-art equipment and research tools for undertaking such investigations. Our staff are committed to optimizing the seated workplace – both vehicular and office settings – and can offer educational materials and seminars designed to help employers and workers recognize, avoid, and fix conditions in the workplace that put workers’ backs at risk.

In vivo Investigations

These studies provide an understanding of the biomechanics/biology of spinal conditions and various surgical procedures such as stabilization using spinal instrumentation. Employing human subjects, the staff investigates the biomechanics of symmetric and asymmetric lifting and its applications to industry by simulating life activities in a laboratory setting.

Results of research efforts

Spinal fusion is typically done to prevent or correct deformity, to stabilize the spine following trauma or pathological destruction, and to eliminate the movement of painful joints. Due to the lack of spinal instrumentation which provide initial stability following spinal surgery, in the past, a patient was confined to bed for a considerable length of time for the fusion to take place. With the advent of modern instrumentation, a patient is allowed to walk and engage in activities of daily living within a few days following spine surgery. In recent decades, the fusion techniques have evolved to include a wide variety of internal fixation devices in an attempt to provide greater correction of deformity, to enhance stabilization, and to increase the rate and degree of bony consolidation. Likewise, the only viable solution to hip joint disorders/discomfort in the past was arthrodesis, or an intentional stiffening of the joint through surgery. With the advent of total hip joint arthroplasty, a procedure involving the use of sophisticated artificial joints, a person is able to lead a normal life following joint replacement surgery. Examples like these are in abundance in many areas of Orthopaedics ranging from fracture fixation, pain to joint replacement. These research and development efforts, led by surgeons, engineers, and other health care professionals are being done to improve the patient’s quality of life while reducing the length of their rehabilitation.

Your contributions are important

These research efforts and the development of new procedures and techniques aren’t possible without your help. If someone close to you, or perhaps yourself, have experienced the debilitating effects that can result from spine disorders and degeneration you can understand why continued research and development is necessary. Without your contributions and monetary support for this program it will be very difficult to continue existing research and embark on new studies enabling us to reach the next level of understanding in the treatment, cure and ultimately prevention of these disorders.